CRS Site - Elyria, OH

Date: 2/4/00

To: Gwen Massenburg

Cc: Tim Drexler, Gary Cygan

From: Jennifer Minnick

RE: Chemical Recovery Systems (CRS) Site Sampling Plan

Overview

This memorandum responds to a request to the FIELDS group to develop a sampling plan. The existing documents and historical data outline the prior commercial uses of the CRS site and lists the results of limited site testing, as well as, testing of the surrounding areas. Testing in these cases was done for a combination of the following VOCs, SVOCs, PCBs, pesticides, metals, cyanide, and PAHs depending on date and location. In order to better characterize contamination on the CRS site, a more detailed sampling plan has been developed. Future monitoring wells may be necessary on site depending on the sampling results. This will allow us to track contaminants and develop a plan for remediation.

Work necessary for site characterization include, groundwater, soil, stream sediment, and surface water sampling in order to assess the potential contamination by VOCs, SVOCs, PCBs, pesticides, metals, cyanide, and PAHs. For groundwater and soil samples, hollow-stem auger drilling combined with a split-spoon sampler is recommended. This was the method used for prior sampling on site. Both groundwater (when reached) and soil samples can be taken in the same location when installing water table wells.

There are two goals to this site characterization; 1) to identify the source and extent of groundwater and soil contamination on the CRS site and; 2) to locate the source and fate of contamination, if any, from the CRS site. Based upon prior studies done in the area by ERM-Midwest (Engelhard Elyria Preliminary RFI, 1992), it is apparent that a component of VOC and SVOC contamination is most likely originating from the CRS site itself. Metal contamination, on the other hand, may be originating from other sources surrounding the CRS site. Therefore, sampling using the method described below can be used to distinguish between metal contamination coming onto the site from an outside source and metal contamination coming from the site.

Soil and Ground-water characterization

The CRS site is rectangular in shape with a north-south dimension of approximately 370' and an east-west dimension of approximately 70'. In order to determine what contamination, if any, is being generated by the CRS site it is necessary to know what may be coming onto the site from the surrounding area. A water table groundwater contour map has been constructed from water levels existing in off site monitoring wells taken in the summer, low water period 1990/1991 (Figure 1). The map shows that there is a predominant east to west groundwater flow from east of the site, across the site, and into the East Branch of the Black River. The Eastern sampling transect should be run perpendicular (north-south) to the groundwater flow, that is, a north-south trending transect and be placed approximately 10' from the eastern border of the CRS site. Along this transect approximately 7 sampling sites should be placed with about 50' separation (see Figure 2). Monitoring wells along this transect shall be at the water-table and to

top of the aqualude, or the shale, in this case. This is required to determine whether contamination exists at depth. The water-table wells will be installed using a split-spoon sampling device to determine soil character at 0-6", and then every 2 feet to bedrock. Based on prior documentation (STEP), depth to the Berea Sandstone bedrock in this area is approximately 4 feet. This results in 3 samples per sampling location and 21 samples total for the Eastern transect. Due to the possible presence of DNAPLs on this site it is important to sample to bedrock. If depth to bedrock is more than 4 feet, additional samples will need to be taken.

Two additional north-south transects (also shown in figure 2) should be made: 1) one approximately in the center of the site called Center transect and; 2) on the far western side labeled Western transect, located approximately 10 feet from the CRS/Black River interface .

The Center transect should approximately bisect the CRS site, about 35 feet from either border. There will be 7 sampling locations on this Center transect, spaced approximately 50 feet apart. Sampling along the Center transect will consist of soil samples taken at 0"-6", then at 2-foot intervals to bedrock. Based upon prior documentation (STEP), depth to the Berea Sandstone bedrock in this area is approximately 12 feet. This results in 7 samples per sampling location and 49 total soil samples for the Center transect. If depth to bedrock is greater than 12 feet, additional samples will need to be taken to due to the possible presence of DNAPLs.

The Western transect should be placed on the western edge of the CRS site approximately 10 feet from the edge of the Black River. Note this transect will follow the Black River trend and therefore will not be a straight line. There will be 7 sampling locations on this Western transect, spaced approximately 50 feet apart. Sampling along the Western transect will consist of soil samples taken at 0"-6", then at 2-foot intervals to bedrock. Based on prior documentation (STEP), depth to the Berea Sandstone bedrock in this area is approximately 20 feet. This results in 11 samples per sampling location and 77 samples total for the Western transect. If depth to bedrock is greater than 20 feet, additional samples will need to be taken.

A total of approximately 175 soil samples will be taken on the CRS site during site characterization. This soil sampling scheme will allow for determining local spill/leakage areas stemming from site use. Contamination of the Black River by the CRS site can be evaluated by comparing what is coming into the CRS site on the Eastern side with what is leaving the CRS site on the Western.

As Table 1 indicates, a total of 5 to 6 deep wells, to the top of the shale, will be required to determine whether contamination has permeated through the sandstone aquifer. Using the contamination data from the Eastern and Western deep well transects will allow for a better understanding of site specific contributions. In addition to the deep wells, 3 intermediate wells, identified in Table 1, will be required in the Western transect. These will be located at a depth approximately equal to the Black River depth at that latitude. This will allow for detection of contamination associated with ground-water flow reaching the Black River from the site.

Sampling surface water and stream sediments will assist in locating Possible Points of Entry (PPEs) of contaminants to the Black River from the CRS site. Two issues may influence contamination of the river from CRS: 1) a storm sewer outfall and; 2) the surface-water-ground-water interface along the river. The pipe drains from a storm drain in the street directly outside the CRS fence line and much of the run-off into the drain is from a paved lot across the street directly to the east of the CRS site. According to STEP, a City of Elyria engineer stated that the storm sewer pipe on the CRS property had been damaged during fill operations and consequently contaminants may be able to migrate through the pipe and into the river. On site investigation will be needed to determine whether or not the storm drain has active flow. If there is flow in the pipe, it is important to note that water flowing through it may already be contaminated depending on its origin. Therefore, having prior knowledge that the groundwater on the CRS site is contaminated, it is possible that the entire interface of the CRS site and the East Branch of the Black River is a PPE for contaminants.

Sediment samples will assist in determining what metal contamination, if any, is coming off of the site and entering the Black River. Sediment samples should be taken at approximately 50 foot intervals (see Figure 2). One sample should be taken north or upgradient of the site as background, 9 additional samples along the course of the River, and one down-gradient of the site. Total count is 11 sampling locations and should be taken at a point approximately 5 feet out into the river under water preferably in stretches of the river below riffling if present. Surface water samples will be taken at the same time and in the same locations as sediment samples.

Sample Location	Sample Type					
	Soil & Groundwater	Groundwater MW shallow	Groundwater MW intermediate	Groundwater MW deep	Surface Water	Sediment
SL1	X	X		X		
SL2	X					
SL3	X					
SL4	X	X		X		
SL5	X					
SL6	X					
SL7	X	X		X		
SL8	X					
SL9	X					
SL10	X					
SL11	X					
SL12	X					
SL13	X					
SL14	X					
SL15	X	X	X	X		
SL16*†	X					
SL17	X					
SL18	X	X	X	X		
SL19	X					
SL20	X					
SL21	X	X	X			
SL22*				X		
SL23					X	X
SL24					X	X
SL25					X	X
SL26					X	X
SL27					X	X
SL28					X	X
SL29					X	X
SL30					X	X
SL31					X	X
SL32					X	X

MW – Monitoring Well

* Existing Monitoring Wells

† Sample groundwater to existing MW depth

Table 1

References

1. Site Team Evaluation Prioritization (STEP) Report for Chemical Recovery systems; Prepared by: Lawrence J. Antonelli; Ohio Environmental Protection Agency – Division of emergency & Remedial response; September 29, 1997.
2. Preliminary RFI Report; Prepared by: ERM-Midwest, Inc., Columbus, OH; Prepared for: Englehard Corporation, Elyria, OH: April 27, 1992.


Chemical recovery Systems Site - Elyria, OH
Sampling Plan
East Branch Black River
SL23
SL24
SL25
SL27
SL27
SL28
SL29
SL30
SL31
SL32
SL15
SL16
SL17
SL18
SL19
SL20
SL21
SL22
SL8
SL9
SL10
SL11
SL12
SL13
SL14
SL1
SL2
SL3
SL4
SL5
SL6
SL7
N
W
E
S
Legend
Sample Types
Soil
Soil & Groundwater
Surface Water & Sediment
Sampling Transect
CRS Property Boundary
0
100
200
300 Feet
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U.S. EPA Region 5
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Figure 2